

Curriculum Vitae

Personal Information:

Name: Fatemeh Mohammadi
Mailing address: Mathematical Sciences Research Institute, 17 Gauss Way, Berkeley, CA 94720, USA
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Citizenship: Iran

Positions:

September 2011 - June 2012: Postdoctoral Fellowship MSRI, Berkeley, CA, USA.

October 2010 - March 2011: Research member at MSRI, Berkeley, CA, USA.

Fall 2009 - Fall 2010: Junior associate researcher at IPM, Institute for Studies in Theoretical Physics and Mathematics, Tehran, Iran.

Fall 2009 - Fall 2010: Instructor at Ferdowsi University of Mashhad, Mashhad, Iran.

Education:

Ph.D. in Mathematics. Amirkabir University of Technology, Tehran, Iran, 2005 to 2009

Thesis Title: On the edge ideals of graphs

Advisor: Dariush Kiani

M.Sc. in Mathematics. Amirkabir University of Technology, Tehran, Iran, 2004 to 2005

Thesis title: On Borel fixed ideals and the Alexander dual of simplicial complexes

Advisor: Rashid Zaare Nahandi

B.Sc. in Mathematics. Amirkabir University of Technology, 2001 to 2004

Research Experience:

2011 Jun: Visit to Professor Hibi at Osaka university, Osaka, Japan.

2010 Jun - July: Visit to Professor Herzog at Essen-Duisburg university, Essen, Germany.

2008 December - January: Visit to Professor Herzog at Essen-Duisburg university, Essen, Germany.

2008 September - December: Visit to Professor Fröberg at Stockholm university, Stockholm, Sweden.

Research Interests:

My interests lie in combinatorial commutative algebra and Algebraic combinatorics:

Gröbner Bases and Applications, combinatorics of partially ordered sets, minimal free resolutions, Betti numbers, CW complexes, cellular resolution of monomial ideals and determinantal ideals.

Refereed Papers:

- [1] *Powers of the vertex cover ideal of a chordal graph*, Communication in Algebra, Volume 39, Issue 10, 2011, 3753–3764.
- [2] *Monomial ideals and toric rings arising from a poset*, with V. Ene, J. Herzog, European Journal of Combinatorics Volume 32, Issue 3, 2011, 404–421.
- [3] *Some algebraic properties of hypergraphs*, with E. Emtander, S. Moradi, Czechoslovak Mathematical Journal Vol. 61, No. 3, 2011, 577–607.
- [4] *Shellable cactus graphs*, with D. Kiani, S. Yassemi, Math. Scand. 106, 2010, 161–167.
- [5] *Weakly polymatroidal ideals with applications to vertex cover ideals*, with S. Moradi, Osaka J. Math. 47, 2010, 627–636.
- [6] *On the Betti numbers of the edge ideals of some hypergraphs*, with D. Kiani, S. Moradi, Beiträge zur algebra und geometry, Vol. 51, 2010, 467–475.
- [7] *A shellable and sequentially Cohen-Macaulay graphs of the form θ_{n_1, \dots, n_k}* , with D. Kiani, Bulletin of the Iranian Mathematical Society Vol. 36 No. 2, 2010, 109–118.
- [8] *The Total Graph and Regular Graph of a Commutative Ring*, with S. Akbari, D. Kiani, S. Moradi, J. Pure Appl. Algebra 213, 2009, 2224–2228.
- [9] *Arithmetical rank of some cacti graphs*, with D. Kiani, to appear in Algebra Colloquium, 10 pages.
- [10] *Poincaré series of some hypergraph algebras*, with E. Emtander, R. Fröberg, S. Moradi, to appear in Mathematica Scandinavica, arXiv:0901.1534.
- [11] *Classification of $M_3(2)$ -graphs*, with S. Akbari, D. Kiani, S. Moradi, to appear in Ars Combinatoria, 10 pages.

[12] *Arithmetical rank of the cyclic and bicyclic graphs*, with M. Barile, D. Kiani, S. Yassemi, to appear in Journal of Algebra and its Applications, arXiv:0805.1657.

[13] *On the associated graphs to a commutative ring*, with Z. Barati, K. Khashyarmanesh, Kh. Nafar, to appear in Journal of Algebra and its Applications, 12 pages.

Submitted Papers:

[1] *Determinantal facet ideals*, with Viviana Ene, Jürgen Herzog, Takayuki Hibi, arXiv:1108.3667v1, 14 pages.

[2] *Hilbert function of binomial edge ideals*, with Leila Sharifan, 14 pages.

[3] *Cohen-Macaulay cactus graphs*, 10 pages.

[4] *Strongly shellable bipartite graphs*, with D. Kiani, S. Moradi, S. Yassemi, 10 pages.

[5] *Resolution of unmixed bipartite graphs*, with S. Moradi, arXiv:0901.3015v1, 8 pages.

[6] *An algebraic criterion for the choosability of Graphs*, with S. Akbari, D. Kiani, S. Moradi, 10 pages.

Papers in Progress:

[1] *Cellular resolutions via mapping cones*, with Anton Dochtermann, in preparation, 10 pages.

[2] *On chordal hypergraphs*, in preparation, 5 pages.

[3] *On the primary decomposition of determinantal facet ideals*, in preparation, 8 pages.

Talks:

2011 November: UC Berkeley Commutative Algebra and Algebraic Geometry seminar, Berkeley, CA, *talk: Determinantal facet ideals*.

2011 June: Department of Pure and Applied Mathematics, Graduate School of Information Science and Technology Osaka University, Toyonaka, Osaka, Japan, *On the cellular resolution of monomial ideals*.

2011 March: Discrete Math Seminar, Arizona State University, Tempe Campus, *Vertex cover ideals of graphs*.

2010 October: UC Berkeley combinatorics seminar, Berkeley, CA, *talk: Weakly polymatroidal ideals*.

2010 April: Weekly seminars on Combinatorics and Computing, school of mathematics, IPM, Tehran, *An algebraic criterion for the choosability of graphs*.

2010 February: The first seminar on combinatorial commutative algebra, school of mathematics, IPM, Tehran, Iran, *On shellable cactus graphs*.

2009 November: 6th seminar on commutative algebra and related topics, school of mathematics, IPM, Tehran, Iran, *talk: Powers of the vertex cover ideal of a chordal graphs*.

2009 November: The first conference on algebraic combinatorics, Tabriz 2009, Tabriz university, Tabriz, Iran, *talk: Sequentially Cohen-Macaulay graphs*.

2009 February: CIMPA School on Computational and Combinatorial Aspects of Commutative Algebra, Lahore, Pakistan, in the graduate student session: *Some applications of weakly polymatroidal ideals*.

2007 July: 21th British Combinatorial conference, University of Reading, UK, *On the $M_2(3)$ -graphs*.

2007 April: The First IPM Conference On Algebraic Graph Theory, IPM, Tehran, Iran, *Some Relations Between Choosability and 2-List Colorable Graphs*.

Conference Experience:

2010 May: Co-organizer, the second conference on algebraic combinatorics, Mashhad 2010, Ferdowsi university of Mashhad, Mashhad, Iran.

2010 March: Co-organizer, Group Theory conference Mashhad 2010, Ferdowsi university of Mashhad, Mashhad, Iran.

Teaching Experience:

Instructor at Ferdowsi University of Mashhad, Mashhad, Iran teaching three courses in each semester with full responsibilities including lectures, office hours, exams, etc.

Fall 2009, Calculus 1, 2.

Spring 2010, Calculus 2, Algebra 1.